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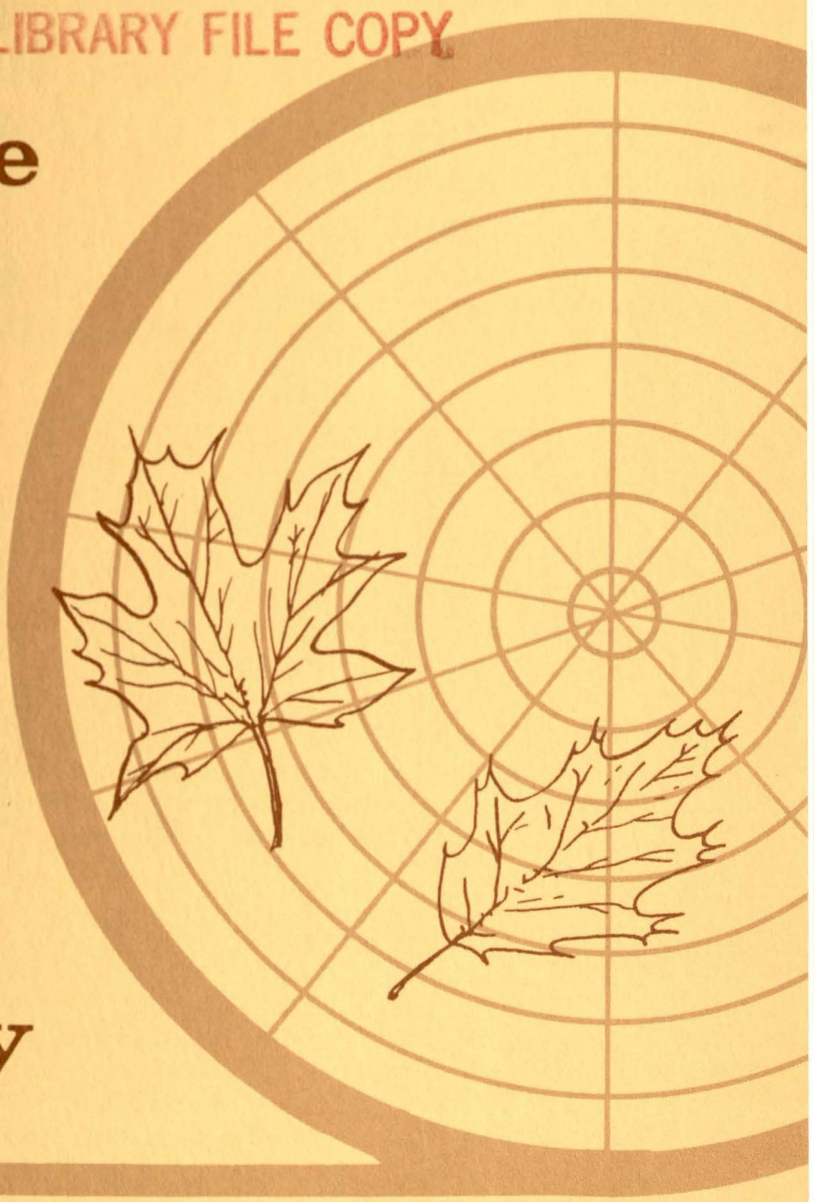
The Changing Hardwood Veneer and Plywood Industry of Michigan and Wisconsin



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THE CHANGING HARDWOOD VENEER AND PLYWOOD INDUSTRY OF MICHIGAN AND WISCONSIN

Gary R. Lindell and
Lewis T. Hendricks

Domestic consumption of hardwood veneer and plywood has been rapidly expanding; however, the industry of Wisconsin and Michigan has not fully shared in this growth. For example, *Census of Manufactures*[1] data show that the value of shipments from Wisconsin hardwood plywood mills (the 1958 Census showed no plywood plants in Michigan) increased about 40 percent between 1958 and 1967, whereas national shipments increased over 80 percent. During this period Wisconsin fell from first to third in value of shipments. Also, total industry employment fell in the two-state area.

Thus, important changes are taking place in the hardwood face veneer and plywood industry of the northern Lake States. Unfortunately, little is known about the nature of these changes and the manner in which they influence and are influenced by the declining industry. To better evaluate trends within this important regional industry, surveys were conducted in 1964 and 1969. This report will describe and evaluate the changes that occurred during this period.

PROCEDURE

Through extensive investigations and interviews with industry personnel, Hendricks developed a detailed picture of the operations of the hardwood face veneer and plywood industry of Michigan and Wisconsin in 1964.[2] These mills were resurveyed in 1969. In the remainder of this report we will describe important characteristics of the industry as of 1969 and highlight changes that occurred between the two surveys.

THE INDUSTRY

In 1969, the industry consisted of the following:[3]

Type:	*Number in:* Michigan	Wisconsin	*Total number of mills:*
Face veneer mills	4	5	9
Veneer and plywood mills	1	11	12
Plywood mills	3	10	13

[1] *U.S. Bur. Census, Dep. Commerce. 1967 Census of manufactures. 1970.*

[2] *Lewis T. Hendricks. A study of the hardwood face veneer and plywood industry in Michigan and Wisconsin. 1967. (Unpublished Ph.D. thesis on file at Dep. Forest Products, Mich. State Univ., East Lansing.)*

[3] *Note that container mills and box factories were not included in the study.*

Face veneer mills were not equipped with presses to manufacture plywood; hence the distinction. Veneer and plywood mills were fully integrated and could peel the logs and manufacture plywood. Plywood mills did not peel veneer but purchased all their veneer for manufacturing plywood. Most mills were located within a 100-mile radius of Green Bay, Wisconsin (fig. 1).

Several changes took place between the two surveys. Two veneer mills added pressing facilities, and thus were classified as veneer and plywood mills in the 1969 survey. One former plywood mill discontinued manufacturing plywood and was not active in 1969. Several mills changed ownership; the general pattern was for mills to be purchased by national, integrated firms. No new mills entered the industry between the two surveys. However, a new veneer and plywood mill was under construction in 1969 in Upper Michigan and production was initiated in 1970. Finally, the ever-threatening fire completely gutted three mills, which were subsequently rebuilt or under reconstruction during the recent survey.

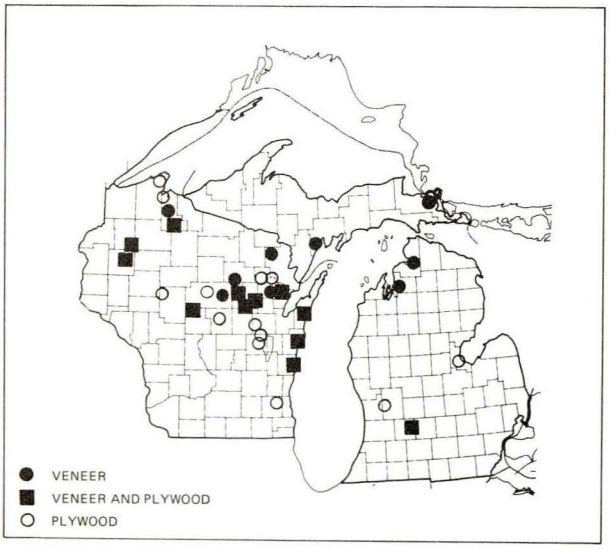

Figure 1.–Location of hardwood veneer, veneer-plywood, and plywood mills in Michigan and Wisconsin, 1969.

VENEER-LOG CONSUMPTION

Veneer-log consumption varied considerably over the 1964-1969 period, ranging from a high of about 32.4 million board feet in 1967 to a low of 24.1 million in 1968 (fig. 2).[4] Important changes also occurred in the species utilized, with red oak and hard maple replacing yellow birch as the major species used. These three species accounted for about two-thirds of total log consumption during the study period.

People involved with the regional forest products industry have speculated on the adequacy of the timber resource in the Lake States to meet future requirements, particularly of the veneer industry. Recent forest surveys show substantial increases in the growth of such important species as hard maple. However, the question still remains as to whether the forests can produce an adequate supply of logs of the size and quality suitable for veneer, at least in the next 5 to 10 years. To give an indication of the severity of this problem, officials of each firm were asked several questions concerning current or expected material shortages (if any).

Apparently the availability of veneer logs has not posed a major problem to the regional industry because officials of only two firms remarked that they were experiencing or were expecting to have difficulty obtaining veneer logs in the near future. These two firms, located in Michigan, were having difficulty obtaining yellow birch logs and found it necessary to enlarge their supply area. Of course many mills experienced seasonal supply difficulties, but these were generally caused by adverse weather conditions and weight restrictions on roads rather than by a shortage of timber.

Mill officials also were questioned about the specifications they were imposing on logs in 1969 and how these might have changed over the preceding 5 years. We thought the mills might have been forced to ease their specifications to obtain an adequate supply of logs. However, such changes were not common. All mills were essentially using the standard veneer-log specifications as promulgated by the USDA Forest Service and the Northern Hardwood and Pine Manufacturers Association. Moreover, practically all the officials interviewed indicated that the specifications had changed little, if any, over the preceding 5 years. The minor changes in specifications that did occur resulted

[4] *Data supplied by Lake States Hardwood Veneer Association; these figures represent approximately 80 percent of the total regional hardwood face veneer production.*

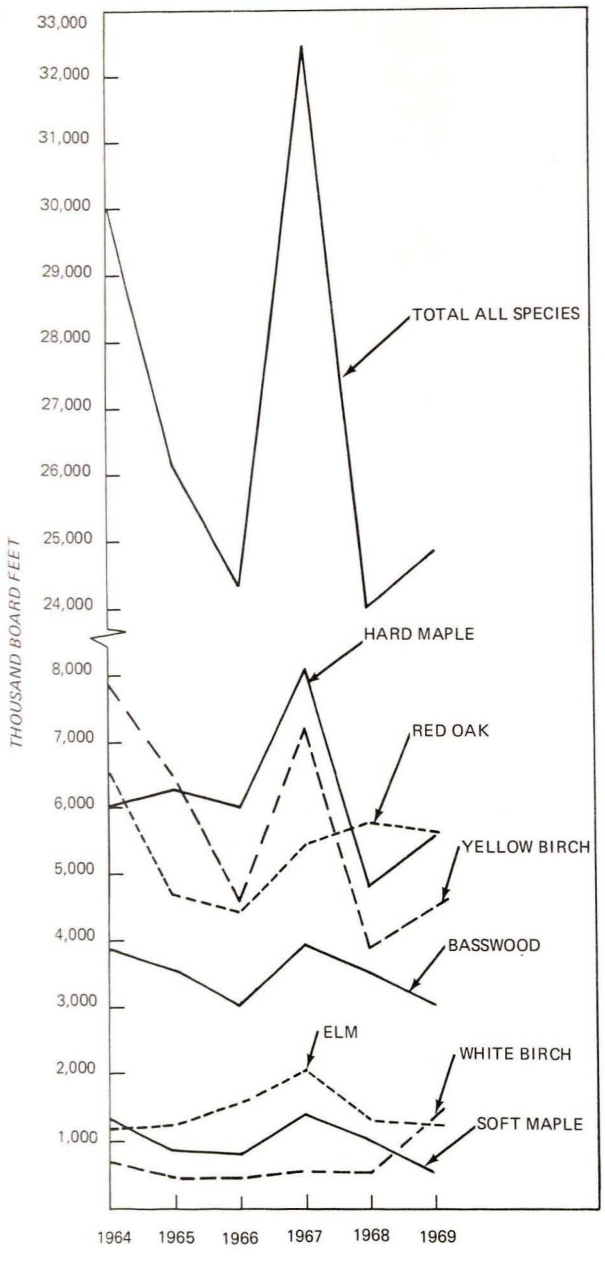

Figure 2.–Veneer-log consumption by hardwood veneer and veneer-plywood mills in Michigan and Wisconsin, 1964-1969.

from seasonal surpluses or shortages of logs. But, in general, mill officials felt that an adequate log supply was not an important problem. The relatively small price changes for veneer logs in Wisconsin in recent years further substantiate this conclusion.[5] Thus, markets were more important in determining the species and type of log used than were log supplies.

Officials from mills that produced plywood also were asked if veneer procurement posed any important difficulties. All of the officials interviewed indicated that adequate supplies of veneer at suitable prices were no problem. However, many mills were purchasing corestock from the southern United States or the tropics. Apparently the regional mills find it to their advantage to specialize in the production of faces and backs and purchase the inner plies.

VENEER PRODUCTION

Veneer production in 1969 was slightly higher (12 percent, surface measure) than in 1964. Probably most of this increase was due to cutting thinner face veneer. Veneer 1/26-inch thick replaced 1/24-inch as the most common face ply (fig. 3). Most of the veneer produced by the two classes of mills that peel was of the common face thicknesses (1/20-inch and thinner).

Veneer and plywood mills (those with integrated operations) produced a larger percentage of core (1/12-inch to 7/32-inch) and crossband (1/16-inch) plies than did veneer mills. Generally, these inner plies were to supplement their own plywood manufacturing operations. Both classes of mills showed a trend away from the production of corestock but a slight increase in the proportion of crossband material. Veneer mills apparently find it more advantageous to specialize in faces (and backs) because practically all of their production was in the common face thicknesses. Ninety-six percent of the veneer was rotary cut (figs. 4, 5). Half-round and sliced veneers comprised the remaining 4 percent.

PLYWOOD PRODUCTION

Because of the wide variety of thicknesses and types of plywood produced, it is difficult to compare volumes produced in 1964 and 1969. Based on surface measure, the volume recorded for 1969 was about 35 percent below that for 1964.

[5] *T. A. Peterson. Wisconsin forest products price review. Dep. Forest., Univ. Wis. 1967-1969.*

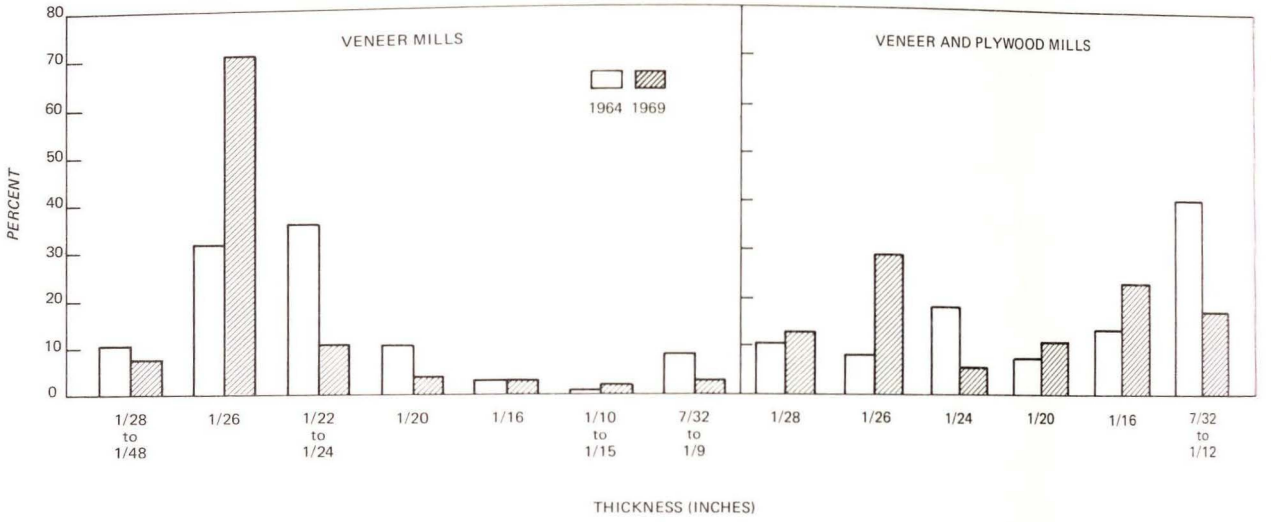

Figure 3.–Thicknesses of veneer cut by hardwood veneer and veneer-plywood mills in Michigan and Wisconsin, 1964 and 1969.

More than 90 percent of the plywood was of all-veneer construction, with the number of plies ranging from 2 to 43 for specialty items. Three-and five-ply were the most common thicknesses.

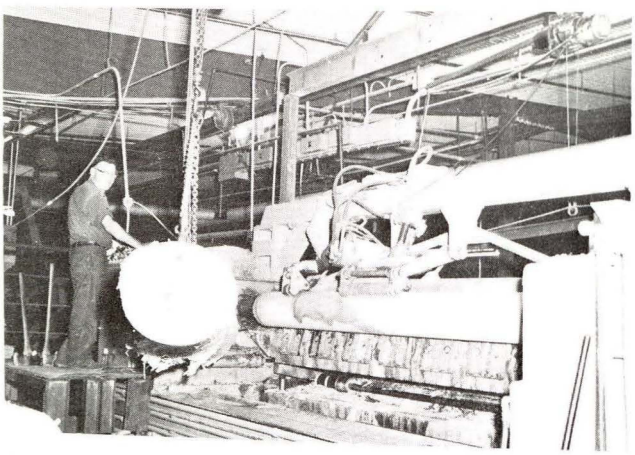

Figure 4.–Veneer bolt ready for chucking on rotary lathe.

Contrary to the apparent national trend, the regional industry experienced a definite shift away from the use of particleboard as corestock between the two surveys. The reason for this is unknown, but one mill manager reported that widely fluctuating and generally rising prices for particleboard corestock prompted him to switch to other materials. Plywood of lumber core construction took up some of the slack.

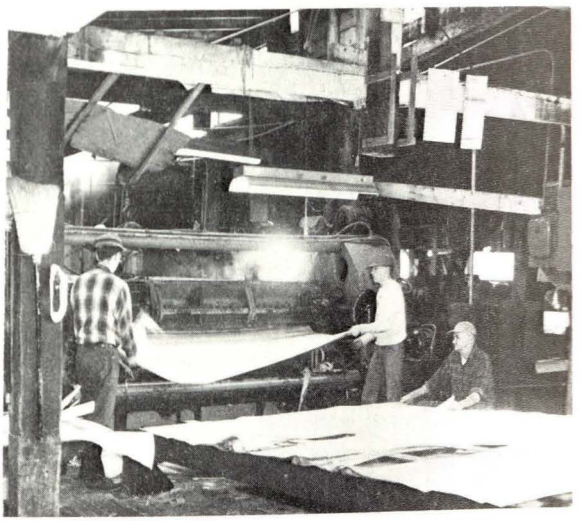

Figure 5.–Sheets of rotary-cut veneer coming off the lathe.

VENEER MARKETS

As noted previously, veneer is produced by both veneer mills and those with integrated operations (veneer and plywood). Although there is some exchange between mills, veneer produced by mills that also produce plywood is generally intended for use within their own plywood manufacturing operations. In addition, these mills are primarily self-sufficient, generally purchasing

only a small portion of their required veneer. Consequently, the following discussion of markets pertains only to veneer produced by veneer mills; it is assumed that all the veneer produced by veneer and plywood mills is used internally and will be reflected in plywood markets, to be discussed later.

The major end market or product for regional veneer mills was wall paneling (fig. 6). About two-thirds of the veneer was so destined (fig. 7). Some of this paneling was produced within the region, although in many cases the veneer was shipped to West Coast mills for mounting on softwood or imported cores. Furniture and doors were the next most important markets in 1969.

There was a definite market shift toward wall paneling between the two surveys. The proportion of the total veneer production destined for this use nearly doubled over the 5-year period, whereas the proportion for doors and kitchen cabinets showed a marked decline. This surge in the wall paneling market conforms with the national trend.

PLYWOOD MARKETS

Wall paneling was by far the major market for plywood produced in regional mills, accounting for approximately three-fifths of the 1969 hardwood plywood production (fig. 8). Doors were next in importance with about one-fourth of the plywood production, and a variety of products constituted the remaining 14 percent. In contrast to veneer markets, plywood markets showed little change in relative importance between the 1964 and 1969 surveys; specialty items (athletic equipment, musical instruments) were the only market showing any appreciable decline.

The industry also displayed a trend away from stock items between the two surveys. In 1964, about 25 percent of the veneer and 7 percent of the plywood was stocked pending receipt of orders. However, in 1969, virtually all of the veneer and plywood was produced to fill specific orders.

INDUSTRY VIGOR

To measure the pulse of the industry, we examined the production-to-capacity ratio of plants and the average age of the equipment in use in 1964 and in 1969.

Capacity and Production

Due to plant modernizations, veneer productive capacity[6] was about 14 percent greater in 1969 than in 1964. Veneer mills were making the most effective use of their productive capacity. In 1969 veneer mill production as a percent of capacity was 76 percent, up 4 percent from 1964. Veneer and plywood mills, on the other hand, showed a loss in efficiency between the surveys with the production-to-capacity ratio falling from 67 to 63 percent. The combined ratio for both types of veneer producers stood at 73 percent in 1969, about the same as in 1964.

The addition of plywood presses in two former veneer plants offset the loss of capacity when a plywood plant left the industry. As a result, total plywood productive capacity remained about the same between the two surveys. Excess plywood-producing capacity remains a chronic problem in the industry, because the production-to-capacity ratio for veneer and plywood mills was only 38 percent in 1969, about the same as in 1964. Plywood mills also showed a marked increase in excess capacity, with the capacity utilization ratio falling from 60 percent in 1964 to 43 percent in 1969. The combined plywood production-to-capacity ratio for both types of mills was only 42 percent in 1969, even lower than the 53 percent recorded in 1964.

Although no attempt was made to determine the capacity ratio at which firms prefer to operate, it is apparent that there was an excess of plywood production capacity in the industry. Excess capacity, in turn, implies that at least some firms were operating at less than their least-cost or optimal output position. This inefficient use of capital results in an upward pressure on costs and reduced profits.

Equipment Age

Another important measure of industry vitality is the age and type of machinery being used and efforts at equipment modernization. Results of the two surveys indicate that mills with integrated veneer and plywood operations made noteworthy improvements in equipment during the 5-year period, whereas the veneer mills and

[6] *In this study capacity was defined as the amount of veneer or plywood that a mill could produce within 24 hours using existing plant facilities and three shifts.*

Figure 6.–Wall paneling is the major end market for regional mills although competition is keen, particularly from imports.

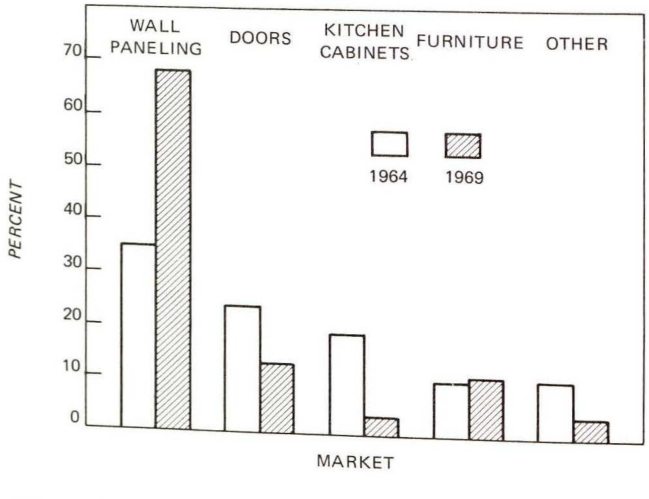

Figure 7.–End markets for veneer produced by hardwood veneer mills in Michigan and Wisconsin, 1964 and 1969.

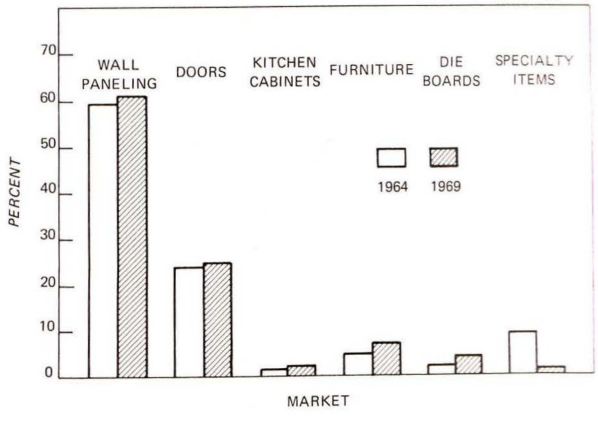

Figure 8.–End markets for plywood produced by veneer-plywood and plywood mills in Michigan and Wisconsin, 1964 and 1969.

The plywood mills made few changes. In 1964 the average age of all equipment in use was 11.9 years, 14.8 years, and 9.4 years for the veneer, veneer and plywood, and plywood mills, respectively (table 1). In 1969 the situation was reversed, with veneer and plywood mills using newer equipment, on the average, than the other two types of plants.

Table 1.—*Average age of equipment in veneer, veneer-plywood, and plywood mills in Michigan and Wisconsin, 1964 and 1969*

(In years)

Type of equipment	Type of mill					
	Veneer		Veneer and plywood		Plywood	
	1964	1969	1964	1969	1964	1969
Veneer manufacture:						
Debarkers	6.3	7.9	9.9	8.5	--	--
Lathes	16.3	19.3	19.2	16.1	--	--
Wet clippers	12.0	16.4	12.1	12.5	--	--
Dryers	20.5	19.3	24.3	23.6	--	--
Plywood manufacture:						
Clippers	10.8	14.2	14.5	13.8	12.2	16.7
Jointers	9.3	6.8	16.2	15.1	12.3	16.8
Splicers	9.5	12.5	13.7	13.8	10.5	16.5
Glue spreaders	--	--	15.4	16.7	8.7	13.7
Presses	--	--	24.6	18.7	17.5	19.1
Trimmers	--	--	15.3	15.1	6.8	10.6
Sanders	--	--	14.2	10.9	4.0	9.0
Average age - all equipment	11.9	15.5	14.8	14.8	9.4	14.9

As a result of periodic replacement of equipment, veneer and plywood mills were able to maintain the average age of equipment at 14.8 years in 1969. However, veneer mills and plywood mills were using primarily the same equipment in 1969 as in 1964, except that it was 5 years older.

The average age of equipment by type and class of mill is presented in table 1. Note that the equipment in use in the important peeling, wet clipping, and drying operations was commonly older than 15 years. Likewise, equipment used in the plywood manufacturing operations was often 14 to 20 years old. It appears that many of the regional mills were operating with outdated equipment, especially in view of such improvements as the dual-spindle lathe and the jet dryer. Three mills had installed or were in the process of installing dual-spindle lathes in 1969. Another three mills had or were installing jet dryers. Although no attempt was made to evaluate the profit capabilities of equipment in use, it seems that many mill managers should take a critical look at their equipment.

DISCUSSION

In general, most mill managers were disappointed with business conditions and their firm's performance in 1969. Whether the situation could be attributed to short-term market fluctuations or longer-term shifts within the regional industry remains to be seen. Residential construction—the best barometer of plywood markets—was down slightly in 1969 from the previous year. A substantial increase in residential construction is forecast for the 1970's, which might improve markets and the outlook for the regional industry. However, it should be noted that several firms were experiencing financial difficulties that transcended several years. At the time of the recent interviews (spring 1970), four mills were temporarily shut down and most mills were operating well below capacity. Several mills appeared to be headed for eventual liquidation.

In general, the industry is not experiencing important raw material shortages, a point that confirms earlier findings.[7] Most plywood mills were purchasing core and crossband material from other sections of the country. Apparently regional mills found it to their advantage to specialize in faces and backs and purchase the required inner plies. For example, one veneer mill was revamped between the two surveys to produce a larger proportion of core and crossband material. However, the parent company found it more economical to purchase this material from other mills and the plant was eventually closed. Several mill managers remarked that raw material costs are now secondary to labor, whereas previously the reverse was true.

One cannot discuss the hardwood plywood situation without mentioning imported plywood, since imports

[7] *Lewis T. Hendricks. Hardwood face veneer and plywood mill closures in Michigan and Wisconsin since 1950. USDA Forest Serv. Res. Note NC-14, 4 p. N. Cent. Forest Exp. Sta., St. Paul, Minn. 1966.*

now supply the bulk of our domestic consumption. Most of the plywood imported in 1969 was paneling from Asia; about 20 percent was Philippine mahogany and birch doorskins.[8] Practically all of the mill managers interviewed remarked that competition from imports—particularly Finnish birch plywood—has intensified in recent years. Finnish plywood is imported primarily in the thicker sizes, which compete for cabinet and furniture markets. Japan—the major exporter of birch plywood to the United States in 1969—is specializing in doorskins, also an important market for regional producers.

On the national scene, domestic producers are moving rapidly into prefinishing of imported plywood. This plywood—practically all paneling—is then marketed together with regular domestic lines.

In addition to the impact of imports, competition between regions has intensified. For example, because of the availability of lower-cost inner plies, the production of "stock panels"—a standard-size veneer core panel, commonly with an unfinished birch or oak face and back —has shifted almost entirely to the West Coast. Previously this was an important item for regional mills.

It appears that most of the problems of the regional veneer and plywood industry are of the marketing nature. Although effective capacity utilization and equipment productivity are continuing problems, the most pressing need is for secure markets.

Veneer mills have rapidly increased the proportion of their product destined for use as wall paneling. This is also where most of the national growth has occurred. However, this market also has the most competition, particularly from imports. It appears as though the region has no important relative advantage in this market; most of the increase in veneer destined for use as paneling apparently was due to increases in the amounts of veneer being shipped to the West Coast for mounting on softwood or imported cores. Plywood mills also showed a slight increase in the proportion of their product destined for use as wall paneling. However, the figures were heavily weighted by one mill that is integrated with a regional marketing chain and specializes in imported paneling.

Probably the most promising markets for regional plywood mills are the low volume-high value specialty products such as athletic equipment, die boards (a form of plywood used by the printing industry), and musical instrument components. Cabinet and furniture stock will probably continue to be important, but again the emphasis will probably be on high quality-low volume items. Likewise, the future opportunities in the paneling market are probably high-value architectural panels. How successfully the regional plywood industry competes may depend on how effectively it can establish and maintain a position in these specialized markets.

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[8] *Gary R. Lindell. Hardwood plywood–output and outlook. Woodworking and Furniture Digest, April 1971, p. 39.*

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